

CLAIMS:

1. A dispenser for dispensing a substance in individual portions counted by a multi-use counter having a display incremented or decremented with the count of portions dispensed and a dispense action detector for detection of portion dispensing, the dispenser comprising:
  - a body having a dispensing orifice;
  - a container for the substance, the container being integral with or accommodated on the body;
  - a mechanism in the body and/or the container for dispensing individual portions of the substance to the orifice, the mechanism having:
    - a displaceable element for initiating the dispensing action;
    - an accommodation on the body for the counter with its detector arranged for detection of dispensing actions of the mechanism; and
    - a closure adapted to co-operate with a portion of the body providing the accommodation for removably enclosing the counter in the accommodation.
2. A dispenser as claimed in claim 1, wherein the closure is tamper-evident.
3. A dispenser as claimed in claim 2, wherein the closure is adapted to be irremovably connected to the body and provided with a frangible portion through which the counter can be removed.
4. A dispenser as claimed in claim 2, wherein the closure is provided with a frangible portion removal of which enables removal of the closure and of the counter.
5. A dispenser as claimed in claim 2, wherein the portion of the body with which the closure co-operates has a frangible portion for release of the counter.
6. A dispenser as claimed in any preceding claim, wherein the closure is a plug fitted into the end of the receptacle to captivate the counter.
7. A dispenser as claimed in any one of claims 1 to 6, wherein the closure is a cap over the end of the receptacle to captivate the counter.
8. A dispenser as claimed in any preceding claim, wherein the closure has a window for viewing the display of the counter.
9. A dispenser as claimed in any preceding claim, wherein the closure provides:
  - an abutment for the counter to maintain the said arrangement of the detector only whilst the counter is enclosed by the closure .

10. A dispenser as claimed in claim 9, wherein the dispenser is for dispensing a gaseous, gas borne or droplet substance and

- the dispensing orifice is a mouthpiece with an inhalation/insufflation orifice at its end;
- the container is a source of the substance accommodated on the body;
- the body has a junction for receiving the substance from the source;
- the source and the junction are arranged to be movable towards each other for release of a substance dose from the source to the junction;
- the dispensing mechanism is a valve provided in the source and/or downstream thereof, for releasing the substance to the mouthpiece a dose at a time;
- the displaceable member is a spout on source, displaceable inwards of the source for release of the dose therethrough to the junction.

11. A dispenser as claimed in claim 10, wherein:

- the accommodation for the counter is a receptacle at the end of the source remote from the spout;
- the body has a cylindrical sidewall extending to the region of the end of the source; and
- the end of the sidewall is adapted to co-operate with the closure.

12. A dispenser as claimed in claim 11, wherein:

- the dispenser is breath-actuated;
- the counter provides an abutment for the source; and
- the junction is movable in the body towards the source.

13. A dispenser as claimed in claim 11, wherein:

- the dispenser is adapted to be actuated by manual pressure on and movement of the source towards the junction; and
- the junction is movable in the body towards the counter and the closure.

14. A dispenser as claimed in claim 11, wherein:

- the dispenser is adapted to be actuated by manual pressure on and movement of the junction towards the source; and
- the junction member is movable in the body towards the source.

15. A dispenser as claimed in any one of claims 1 to 8, wherein the dispenser is for dispensing a gaseous, gas borne or droplet substance and

- the dispensing orifice is a mouthpiece with an inhalation/insufflation orifice at its end;
- the container is a source of the substance accommodated on the body;
- the body has a junction for receiving the substance from the source;
- the source and the junction are arranged to be movable towards each other for release of a substance dose from the source to the junction;
- the dispensing mechanism is a valve provided in the source and/or downstream thereof, for releasing the substance to the mouthpiece a dose at a time;
- the displaceable member is a spout on source, displaceable inwards of the source for release of the dose therethrough to the junction.

16. A dispenser as claimed in claim 15, wherein:

- the accommodation for the counter is a receptacle at the end of the source remote from the spout;
- the body has a cylindrical sidewall extending to the region of the end of the source; and
- the end of the sidewall is adapted to co-operate with the closure.

17. A dispenser as claimed in claim 16, wherein:

- the dispenser is adapted to be actuated by manual pressure on the counter and movement of the source towards the junction,
- the closure is arranged to provide:
  - both an abutment for the counter between actuations and
  - manual access to the counter for depression of both it and the source towards the junction;
- the junction is fixed in the body.

18. A dispenser as claimed in claim 16, wherein:

- the dispenser is adapted to be actuated by manual pressure on the counter and movement of the junction towards the source,
- with the closure being arranged to provide:
  - both an abutment for the counter between actuations and
  - manual access to the counter for depression of both it and the junction member towards the junction;
- the junction member is movable in the body towards the source.

19. A dispenser as claimed in any preceding claim, wherein the source is a metered dose source.
20. A dispenser as claimed in claim 19, wherein an additional valve is provided downstream of the source.
21. A dispenser as claimed in any preceding claim, wherein the counter is a force actuated counter, acting as an abutment for the source.
22. A dispenser as claimed in any one of claims 1 to 20, wherein the counter is a displacement transducer arranged to detect a small movement of the source between its position in which the junction is moved towards it for dose release and its quiescent position or vice versa.
23. A dispenser as claimed in any one of claims 1 to 20, wherein the counter is an acoustic transducer for detecting dose release by a distinctive sound of the release.
24. A dispenser as claimed in any preceding claim, wherein the counter has a probe in contact with the source.
25. A dispenser as claimed in any preceding claim, wherein the probe is arranged to detect removal of the source from the dispenser and to reset the counter for new use in another dispenser.
26. A dispenser as claimed in any one of claims 1 to 9, wherein the dispenser is for dispensing doses in pill form and
  - the dispensing orifice is an opening in the body;
  - the container is a compartment slidably carried in the body;
  - the dispensing mechanism is
    - a neck of the compartment for aligning pills to be dispensed one at a time with movement of the neck outwards of the body and includes
      - a spring for biasing the neck inwards of the body; and
    - the accommodation is a receptacle in the body for the counter, the receptacle being closed by the closure.
27. A dispenser as claimed in claim 26, wherein the container has a feature arranged to approach the counter for incrementing/decrementing the counter on dispensing movement of the container.
28. A dispenser as claimed in claim 27, wherein the feature is the spring.
29. A dispenser as claimed in claim 27 or claim 28, wherein the spring abuts the counter for return movement of the container after a dispensing action.

30. A dispenser as claimed in any one of claims 26 to 29, including an interlock preventing extension of the neck without removal of an interlock stop.
31. A dispenser as claimed in any preceding claim, the dispensing mechanism is disabled in the absence of a counter enclosed by the closure.
32. A method of making a dispenser for dispensing a gaseous, gas borne or droplet substance in individual portions counted by a multi-use counter having a display incremented or decremented with the count of portions dispensed and a dispense action detector for detection of portion dispensing, the dispenser being as claimed in either of claims 11 and claim 16 or any other appendant thereto and having:

- a main part of the body and
- an adjustable part of the body which encircles the source, is adapted to receive the closure and is adjustable longitudinally of the source to compensate for source-length tolerance,

the method including the steps of:

- assembling the source to the main part of the body within the adjustable part;
- adjusting the adjustable part to compensate for the said tolerance; and
- fixing the adjustable part to the main part in its adjusted position.

33. A method as claimed in claim 31, wherein the adjustment step is performed by:

- fitting a dummy closure to the adjustable part, whereby the dummy closure replicates the abutment to be provided in the dispenser for the source by the counter fitted against the abutment provided by the counter;
- setting the mechanism to its position in which the spout is urged inwards for dose dispensing;
- moving the dummy closure, adjustable body part and source inwards until a dose is released; and
- fixing the adjustable part in this position.

34. A multi-use counter for a dispenser as claimed in any one of claims 1 to 29, the counter comprising:

- a display for indicating number of doses consumed or still available to be consumed,
- a dispense action detector and

- a reset probe activated to reset the counter on its removal from the dispenser either manually or by the action of fitting it to its accommodation on a dispenser.